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ABSTRACT

Designed for the archery novice, this booklet details teaching methods, safety precautions, skills, equipment, and facilities used for teaching high school students. Archery games, a list of instructional resources, and a bibliography follow the text. (CJ)

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ARCHERY INSTRUCTION FOR STUDENTS IN GRADES 7-12

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ARCHERY

7-12

Basics
Equipment
Safety
Facilities
Instructional Resources

INTRODUCTION

Archery is a skill that has been around for many years. It is nearly impossible to document the exact date when man first started using the bow and arrow either for survival or for sport. What can be documented is the recent trend of increased popularity by all ages in the sport of archery. Many people are realizing that archery provides men, women, boys, and girls with a sport which can be used throughout a lifetime. One of the great aspects of archery is that it is one sport where a partner is not necessary.

In order to provide people of all ages with good sound instruction and proper technique, group instruction becomes necessary. It is the intent of the following material to provide physical educators with the most up to date teaching techniques in archery. The material is designed for beginners only. There is much more detailed information for those who wish to pursue the sport in the selected material listed in the bibliography.

There is one basic assumption that is quite important before going on and that is: "Those who teach Archery should possess reasonable skill and the ability to teach others correct shooting techniques."[1]

I. BASICS

There are two main ingredients that any teacher should be aware of before starting a unit in archery. They are immediate participation and immediate success. One should keep in mind the fundamental principles of learning in education.

1. Start shooting at a short distance. (20 feet) Students will hit the target with their first group of arrows = Immediate Success.

2. Place the target on the ground to prevent losing arrows, therefore, more time can be spent shooting = Immediate Participation.

3. Check eye dominance. Have students extend both arms and make a triangle with open palms toward a target (see diagram), then with both eyes open place the target in the center of the triangle, now close the left eye. If the target remains in the center have them reverse the procedure closing the right eye. The students should then shoot right handed if the target stayed in the center with the left eye closed or shoot left handed if the target stayed in the center with the right eye closed.

4. For beginning instruction have the left handers located at the right end of the shooting line. This will allow them to see the instructor better as he demonstrates from the right end also.

[1]Archery - AAHPER, Washington, 1972

5. Review all safety precautions in Section III before beginning instructions proceed. This is for the students' safety as well as the instructor's.

6. Instruction should take place at the shooting line using the partner or "buddy" system. One group is taught and they in turn teach their partners. (The student coach/shooter method works great.) Instruction Procedure is taken exclusively from the AAHPER Planning Guide For Group and Individual Instruction.

7. The following steps in the instruction procedure are broken down into two categories, Static and Dynamic. Although each step will be covered the steps will not be taught in the exact order of use. Once the students learn each step then each student should follow the 10 steps exactly as shown.

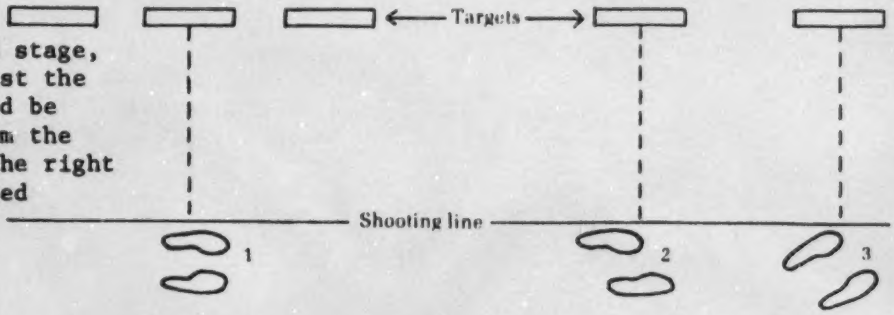
Static	Dynamic
1) Stance	7) Draw - Anchor
2) Nock Arrow	8) Aim - Hole
3) Set Hook	9) Aim - Release
4) Establish Bow Hand and Arm	10) Aim - Follow Through
5) Head Up	
6) Raise Unit	

Directions will be given for right-handed shooters; left-handers should do the opposite. Divide participants in partners, 3's or 4's depending upon the number of bows you have available. Remember Immediate Participation and Immediate Success.

Figure A

ESTABLISH STANCE (Figure A - page #2): Have the students stand at a right angle to and with their left shoulder toward the target (left-handers should stand with their right shoulder toward the target). Weight should be evenly distributed and feet should be as wide apart as is comfortable (approximately shoulder width). This is the square stance. Instruct students to move their right foot forward, toward the person in front of them, until the instep of their right foot lines up with the toe of their left foot. Tell students to raise up on their toes and take a 1/8 turn toward the target. This is the oblique stance.

Note that in the 3rd stage, the left foot (nearest the shooting line) should be rotated 1/8 turn from the original position; the right foot should be rotated slightly less.



Establishing the stance. Square Stance Oblique Stance

The oblique stance is used because (1) it allows beginners to use the back muscles immediately; (2) it moves the string away from the bow arm so there is less chance of string slap; and (3) it gives the student a secure base.

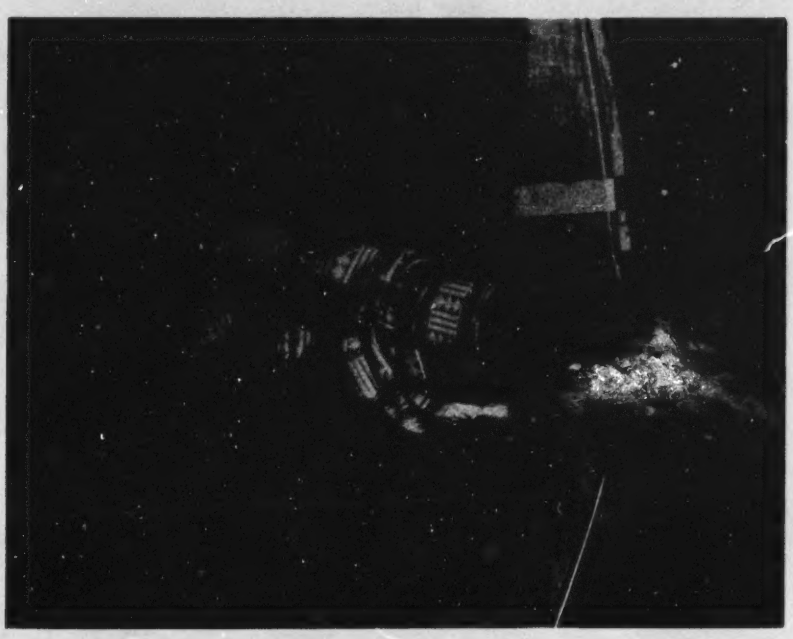


Figure B

ESTABLISH BOW HOLD (Figure B - page #3): Have each student extend his left arm toward the target with the left hand in a "handshake" position. Direct each student to grasp the lower limb of the bow with the right hand; place the pivot point of the bow handle in the "V" formed by the thumb and forefinger around the back of the bow with the thumb resting lightly over the forefinger. The other three fingers should be pointing toward the target.

Inform students that the pivot point should touch only the meaty part of the thumb and that no other part of the hand or palm should touch the bow. The extreme of extending the last three fingers toward the target will help the student keep the palm off the bow. This should result in a relaxed hold on the bow and avoid a "gripping" on the bow handle. The wrist should be straight, but relaxed. Have the student relax and hold the bow at his side with the string up so that the bow does not interfere with students on either side. Tell each student to raise his head, look at the bullseye, raise the bow arm to shoulder height, and lower again to the side.

Figure C

SET A HOOK (Figure C - above): Without the tab in shooting position, demonstrate and have the class do a "Boy Scout salute" (with the thumb and little finger of the right hand touching over the palm and with the other three fingers straight). Now have the students set a hook by pointing the tips of the three string fingers toward the thumb. The students should hook the first three fingers onto the string at the nocking point so that the string lies in the crease made by the first joint of each finger.

The back of the hand should be kept straight--a cupped hand is incorrect. When the students draw, you will note that the pressure of the string will force the fingers to straighten slightly and this is correct. The Boy Scout salute is used to keep the thumb off the arrow, but as the students shoot for a while, the thumb and little finger will relax.

PRACTICE RELEASE: With the completed unit (bow hold, arm straight down at side, and fingers on the string), have the class raise head to look at the bullseye, raise both arms to shoulder level, and stop. Instruct class to draw the bowstring 1 inch, relax the fingers, and let the string roll off the fingers. If you tell the class "1 inch," almost all will draw 3 to 5 inches; if you say "5 inches," they will draw 15 inches.

Have students repeat this drawing and releasing of the string at least three more times or until most of the students have the feel of the release. This can be done while the bow arm remains in position so it is unnecessary to go through the whole routine of forming the unit each time.

Figure D

ESTABLISH AN ANCHOR (Figure D - above): With the draw hand in correct position (but not on the string--Boy Scout salute in hook position), demonstrate and have the students hook the "V" made by the thumb and forefinger behind the jawbone. Students should lay the forefinger along the face so that the tip of the forefinger touches the corner of their mouth, with all three string fingers still in proper hook position. Another method: Tell students to look at the person in front of them; then, have them place the hook on their mouth and turn their head to look at the target. (This may help them locate the anchor position.) This is the high anchor.

Explain to the class that archery is a game of consistency and that the anchor point is one of the most important parts of consistency in shooting. An exact anchor establishes the velocity of the arrow, as the length of the drawn arrow will determine the number of pounds of the bow that are utilized. Consequently, if the bow were drawn 1 inch longer one time than another, it would impart approximately 2 pounds more energy to the arrow. Raising or lowering an anchor point will have the same effect on trajectory as raising or lowering the rear sight of a rifle.

Figure E

PRACTICE DRAW (Figure E - above): Prior to giving this instruction, tell the students that they should never let go of the bowstring at full draw without an arrow because the bow might break.

Have the students assume the stance and establish bow hold, with the hook and fingers on the string (again not using the tab). Then instruct the students to straighten bow arm, raise their head, look at the target, draw to anchor, and *let down*. Line B may be used to check Line A, and vice versa.

CAUTION: *Never allow an arrow on the bow during this exercise.*

Repeat this several times. As the lines repeat the exercise, check the path each student's string is going to travel to be sure that there is string clearance to avoid string slap on the arm. With female students be sure the string is on the outside of the breast. Some students will have a hyperextended elbow or for some other reason it appears that the string will hit the arm. This will be a minority of the students and they should be worked with individually. There are two common ways to eliminate this problem:

a. Tell the student to extend the bow arm at shoulder level toward the target; bend the bow arm at the elbow; bring the handle of the bow in to the chest; and re-extend the arm.

b. If this does not position the bow properly, have the student extend the bow arm toward the target at shoulder level and from the shoulder roll the whole arm, including the elbow and wrist, until the bow is horizontal to the ground. Then have the student straighten the bow with just a turn of his wrist without moving the rest of his arm.

Figure F

NOCK ARROW (Figure F - above): *Line A only:* With the bow hand in place and with the string against the hip, have the students take an arrow from the quiver, holding the arrow at the crest between the thumb and index finger. Instruct them to push the nock of the arrow onto the string just below the nock locator. The cock feather (odd-colored feather) should be away from the bow, and the shaft of the arrow should be lying on the arrow rest. Be sure that no student holds the arrow with the index finger of the bow hand. Pinching the nocks makes this unnecessary.

RELEASE ARROW: Using the finger tab and with the arrow now in place, have the students re-establish the stance and set the hook on the string, with index finger above the nock of the arrow and the next two fingers below the nock. They should re-establish the bow hold, making sure the bow arm is straight at the side. Talk the students as a group through each of the 10 steps. Have the students raise their head, look at the bullseye, raise the unit, stop (with elbow of the draw arm slightly above the plane of the arrow), draw to anchor, and release--thereby shooting an arrow.

Prior to the completion of this first shot, a very short explanation of instinctive aiming should be given but not dwelt upon. It is sometimes helpful to use an analogy, such as: shooting a bow instinctively is similar to throwing a baseball; concentrate and focus eyes upon the point you want to hit. Do not look at the arrow or bow, but *keep both eyes open.*

After shooting the first arrow, use the 10 basic steps and talk Line A through a second arrow. Have Lines A and B exchange places. Talk Line B through four arrows. Have Lines B and A exchange places again and talk Line A through their remaining two arrows.

Repetition is extremely important in teaching a person to shoot a bow. Talking the class through these first shots serves as a safety control and gives the students repetitious verbal direction.

If this procedure is followed, all students should have shot a minimum of four arrows in the first 30 minutes.

In these first few arrows the instructor should be concerned only that the student does not hit his arm and is able to hit the target. Perfect form is immaterial at this stage. Emphasis should be on immediate participation and immediate success.

RETRIEVE ARROWS: After all students have shot four arrows (six, if time permits), demonstrate and explain the proper methods of retrieving arrows from the target and ground. Explain the duties of the foursome in retrieving arrows. Have each group assign: *a target captain* whose duty is to withdraw all arrows from the target; *two arrow receivers* whose duties are to record scores and receive the arrows as the captain withdraws them from the target; and an *arrow retriever* who retrieves arrows that missed the target.

It is each individual's responsibility to pick up all arrows he sees lying on the ground and give them to the arrow retriever. Caution the students to walk *slowly* to the target and watch for arrows on the ground. Demonstrate that an arrow buried under the grass should be withdrawn point first and be completely clear of the grass before the arrow is lifted.

Explain and demonstrate withdrawing arrows from the target. Have students place their left hand flat upon the target face with the arrow shaft close to but not touching the base of the "V" made by the thumb and forefinger. During this operation the person withdrawing the arrows should stand to the left of the arrow and lean slightly over the top of it. He should then grasp the arrow shaft with the right hand at a point closest to the left hand and the target, and pull the arrow straight out of the target, being careful not to bend the arrow shaft up or down, right or left.

Point of Safety: Stress that no one stand directly in front of the target while arrows are being withdrawn.

The arrow receivers should not attempt to separate the arrows at the target. After all scores have been recorded and arrows are withdrawn, the receivers take the arrows to the shooting line before separating them and giving them back to the shooters.

Point of Safety: The target captain is responsible for each member of the group. It is his job to remain in front of the target until all members of his group have started back to the shooting line.

If the target groups are fewer or more than four people, adjust the target assignments accordingly. After assignments have been made and the withdrawing of arrows has been demonstrated, have the students retrieve their arrows and return to the shooting line.

For the remainder of this unit the students should shoot as much as possible with a minimum amount of instruction. However, the instructor should talk the lines through at least the first arrow of each end.

Have students shoot one end at 20 feet; talk them through the 10 steps for at least half the arrows.

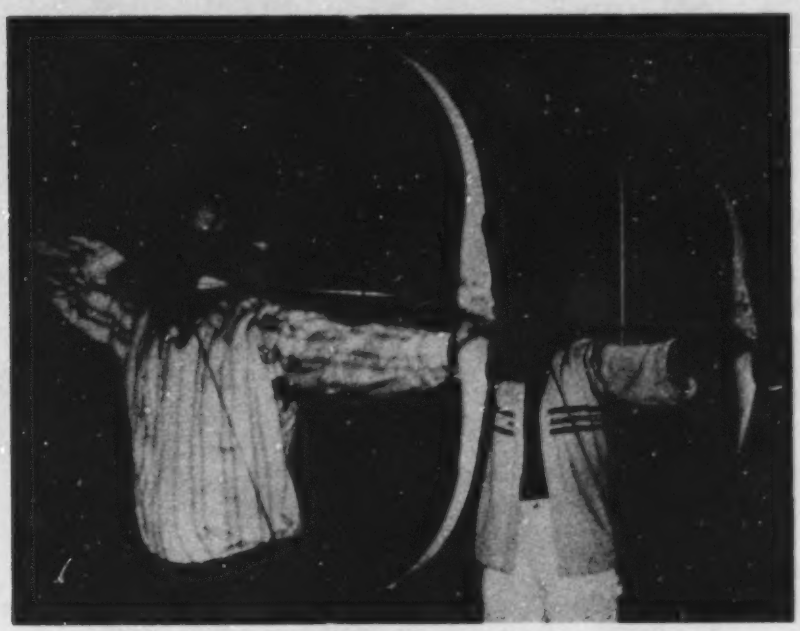


Figure G

FOLLOW THROUGH (Figure G - above): Tell the students to continue to aim, with eyes focused on the bullseye, and bow arm and drawing hand still in shooting position for a count of two after the release. A good trigger phrase is "hold a pose," as for a picture. An analogy of the follow through could be that of shooting a rifle. If, upon squeezing the trigger, the barrel is moved, the bullet will be thrown off-target in that direction. The same thing happens with movement in the bow arm upon release: if the bow arm is dropped, the arrow drops.

It is natural for the bow arm on a right-handed shooter to move slightly left and down on the release because of the sudden release of tension.

Have the students shoot an end concentrating on follow-through. It is recommended at this point to continue to talk the line through at least one arrow of each end.

Inform the class that while Line A is shooting, the corresponding target members on Line B will act as student coaches; similarly, when Line B is shooting, Line A will act as coaches. If there is room, each student coach should stand on the shooting line facing his corresponding shooter. If there is not room on the shooting line, each coach should stand behind and slightly to the side where he can watch the shooter's anchor, release,

and bow arm. This system enables the instructor to have better control of the class and keeps all students occupied. It also gives the student coaches a better perception of their own shooting.

The student coach's job is to remind the shooter to concentrate on the 10 basic steps. The coaches should be cautioned to offer suggestions to the shooter only between arrows, not while the shooter is at full draw. They should also be cautioned never to reach through the string. The student coach/shooter relationship affords an optimal learning opportunity.

The remainder of this unit should be spent in practice to acquaint students with the student coach situation, with emphasis on each of the 10 steps, including follow-through.

RELEASE: Explain and demonstrate the live release. A live release is a normal reaction of the drawing hand moving back, with the string rolling off the fingers as they are relaxed. This hand reaction is caused by the back muscles and not by pulling the fingers off the string. Emphasize that the release remains an action of relaxing the fingers and letting the string roll off, and that the natural reaction of the back muscles pulling together will cause a slight backward movement of the drawing hand and a slight downward and outward movement of the bow hand.

An excellent way to demonstrate the action of a live release is to place the drawing hand in anchor position, invert the bow hand, and hook the three fingers of the drawing hand. Holding the drawing hand in anchor position, start pulling the hands in opposite directions and transfer the pull to the back muscles.

Have the students shoot one end, concentrating on live release. Utilize student coaches. Spend as much of the remaining time as possible shooting while concentrating on and repeating the basic 10 steps. Reserve enough time to teach the students how to unstring and string a bow.

STRING AND UNSTRING A BOW (STEP-THROUGH METHOD): This method is the only safe method to use without the aid of a mechanical bowstringer. (*It is strongly recommended that commercial bowstringers be considered in the program.*) Caution students that improper use of the step-through method will twist the limbs of the bow and could cause the bow to break.

1. Have students check to make sure that the bottom loop of the bowstring is properly seated in the string groove on the lower limb. A rubberband stretched around the string and bow will hold the lower loop in place.

2. While the students are holding the bow by the upper limb in their right hand, tell them to look at the position of their right foot; step across the bow with the right leg; and return the right foot to the same position.

3. Instruct them to lay the curve of the lower limb over their left ankle. With the lower loop in place, have them hold the string taut in their left hand.

4. Then have the students place the handle of the bow under their right thigh, keeping the right knee slightly bent.

5. The students should place their right hand beneath the curve of the top limb--palm open. The bow should rest across the palm and base of the thumb, the elbow held high.

6. Have the students keep their left leg straight; raise their left heel off the ground and outward; and push forward with the right hand while locking the right knee so that the bow bends naturally.

7. The students should then slip the top loop of the string into place and relax -- *slowly*.

8. Have the students check to see that the string is seated properly in the nock before releasing the tension on the bow.

To unstring the bow, just have the students reverse this process. It is a good idea to string and unstring the bow several times until it becomes easy and natural to do. From this point on, stringing and unstringing will be done by the students at each session.

Have the students shoot one end at <u>20 feet</u>; talk them through at least one arrow. After the first end, move the class to <u>15 yards</u>.

Figure H

AIM-PRE-GAP (OR PRE-DRAW-GAP) METHOD (Figure H - page #11): This is a method of teaching the student to shoot without a bow sight, and is an aid for teaching instinctive shooting. The principle behind it is that it sets the shooter's arm on a plane with the target and in proper position so that at full draw his concentration can be entirely on the spot he wants to hit. It is important after the pre-gap spot is established and the unit is set that nothing moves except the draw to anchor. The bow arm must remain as steady as possible. The pre-gap shot does not have to be exact because the shooter's instinctive ability will take over as he holds at full draw and concentrates on the target. He will instinctively make the minor adjustments necessary. The pre-gap method is not an end in itself, but the basic mechanics of the method give the students security in learning instinctive shooting.

Talk the students through the first six basic steps in shooting, raising the unit. (1) Then have them look across the point of the arrow to a predetermined spot. If students stand 15 yards from a 36-inch target with a 20- or 25-pound bow, a spot at the base of the bale will usually enable them at least to hit the target. It is important that they get the sensation of "being on the spot." Have the students maintain bow arm position and body position. (2) Tell them to shift their eyes to the center of the bullseye and concentrate on the center, holding as steady as possible. (3) Next have the students continue through the dynamic steps of shooting--draw to anchor, hold, release, and follow through--maintaining body position and bow arm position until after the arrow has hit the target.

Help the students to adjust the predetermined spot by having them note where the first arrow entered the target. It a student's arrow was high, tell him to lower the spot; if his arrow was low, tell him to raise the spot.

Continue to talk students through this method, arrow by arrow for at least two ends. Remind them to shift their eyes to the bullseye prior to the draw. On the third end explain to the students that they can see the point of the arrow in their peripheral vision while keeping their eyes on the center of the target. Have them set their pre-gap same sight setting and shoot the remainder of their arrows. When they have finished shooting their arrows, they should then readjust the sight setting as above.

The remainder of this unit should be spent on practicing sight shooting with the low anchor. At the end of this unit reserve enough time for a short discussion period. Inform the students that they have been exposed to two different types of anchor--low and high; and two different methods of aiming what they prefer, stick with them, and develop their form.

COMPETITIVE ROUND: Listed below are two rounds that are adaptable to instructional use. In conducting a competitive round or tournament, two practice ends should be allowed before the scoring begins. The purpose of these rounds is to expose students to the mechanics of a tournament. The scores might be used as a part of the skill evaluation.

Instructional Round I

Distance: 20 yards

Target: 36-inch, 4-color face

Total arrows: 60 (5 arrows per end, 4 ends per game; 3 games per round)

Score: 5-4-3-2-1

Total points: 300

II. EQUIPMENT

To insure Immediate Success and Immediate Participation each student should have proper equipment when it is their turn to shoot. Proper equipment consists of a 20-25 pound center shot bow, an arm guard and finger tabs for those who need them and six arrows.

Bows: It would be ideal to have one bow for every two students in each class although one bow may have to be shared by three students. Never go beyond three students/bow as immediate participation will not exist.

Try to purchase 62 or 64 inch bows if possible. They are easier to shoot in most cases. Also there is really no reason to purchase bows heavier than a draw weight of 20-25.

Arrows: Again it would be ideal for everyone to have six aluminum arrows but the cost would probably be prohibitive. The best solution to the arrow problem is to purchase enough arrows so that everyone that is shooting will have six arrows. For planning purposes the average teenager will use a 26-inch arrow while the sub-teen will use a 24-inch arrow.

Be extremely careful that the arrow is not too short. A way of arrow measurement is to take the arrows the student wishes to use and place the arrow nock in the middle of the chest. Then extend both arms, palms together down the arrow as far as he can reach. The point should extend 1/2 inch beyond the fingertips. The arrow can be more than 1/2 inch but never less. Shooting arrows that are an inch or two long will not be a major factor for beginners.

The type of arrow purchased can be wood, aluminum or fiberglass. It is recommended that aluminum be purchased because they don't usually break and can be straightened where as wood will not last as long but the price for wood arrows is much less. Fiberglass is somewhat more expensive than aluminum.

Arm Guards and Finger Tabs: Both items can be purchased for minimal cost and will usually fit everyone. The correct number to purchase would be one for every two students. Some students may never use a finger tab.

III. SAFETY

1. Bows and arrows are weapons capable of inflicting serious injury and death. Never point an arrow (in a bow) at another person under any circumstances: a nocked arrow is like a loaded gun.

2. Do not have anything in or on the front of your shirt which might get caught on the bowstring.

3. An arm guard is a must. So are tabs or gloves.

4. Never draw or release a bow without an arrow in it.

5. Never shoot an arrow straight up into the air.

6. Always shoot at a definite target; never shoot just for the sake of shooting.

7. Never try to shoot far, except on a safe flight range.

8. Before starting to shoot be sure all archers are on or behind the starting line. Be sure there are no strollers near the path of the arrows.

9. Don't shoot if there is anyone across the shooting line.

10. When you are shooting in a class, or with any group, never nock an arrow until after the signal is given to shoot.

11. Never step across the shooting line to retrieve an arrow that has fallen from your bow. If you can reach it with your bow while standing astride the shooting, you may pull it back.

12. Step back about three yards from the shooting line when you have finished shooting.

13. Stay behind the shooting line until the signal is given to retrieve arrows, when all archers will go at one time to retrieve.

14. Inspect all equipment frequently to see that it is in good shape. Never use a bow or an arrow that is damaged. Do not use a bowstring when there is any doubt about it.

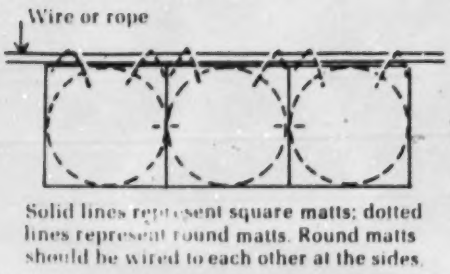
IV. FACILITIES

Taken exclusively from AAHPER Planning Guide for Group and Individual Instruction.

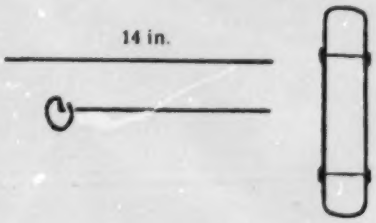
Indoor Facilities

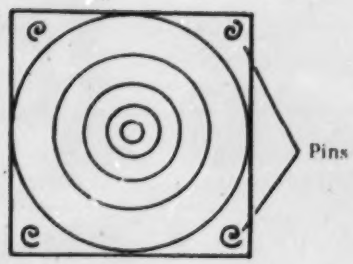
SHOOTING AREA: Areas that can be used for shooting include a gymnasium floor or balcony, a band room, a stage, a furnance room, a multipurpose room, or wide corridors. Although an area that measures 90 by 90 feet is ideal for the average beginning class, this is not always possible. An area of 30 by 50 feet is satisfactory; it can accommodate as many as 10 36-inch target matts and 40 shooters. If space is limited, however, classes can be conducted effectively in a smaller area.

Targets



Solid lines represent square matts; dotted lines represent round matts. Round matts should be wired to each other at the sides.





TARGET MATTS: The types of target matts available are round matts of Johnson grass or straw, and square matts of excelsior or plastic foam. *Excelsior or straw matts that are used indoors must be fireproofed.* This manual suggests 36-inch matts because they are a practical size for instruction and are lighter in weight and easier to handle than a larger target. The newer plastic foam matts are especially portable and practical where targets must be taken in and out-of-doors for each shooting session.

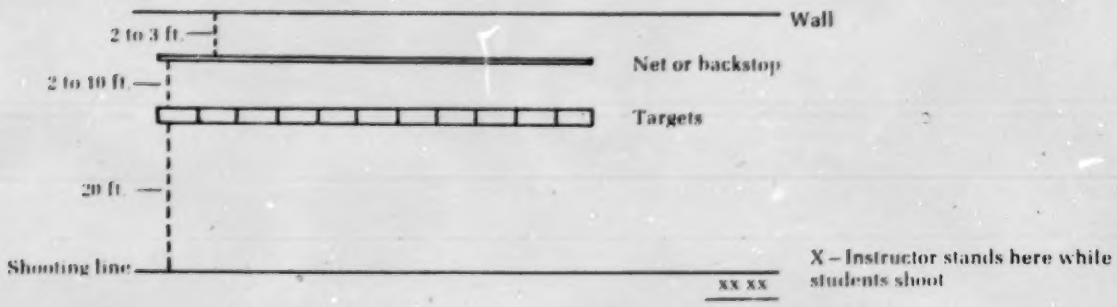
TARGET FACES: For basic instruction it is suggested that target faces by 36 inches (or same size as matts being used) and four-color (five rings-gold, red, blue, black, white). If possible, a paper target face should be glued to corrugated board (cardboard) before attaching the face to the matt; this will increase the target life many times. Faces can also be purchased with cardboard backing.

Target faces are attached to the matt with commercial target pins or pins made from clothes hanger wire or equivalent. Use a piece of wire 14 inches long for each pin. Make a right angle at 3 inches and bend the 3-inch

piece so that it is curved. Put the remaining 11 inches of the wire through the target face and matt and bend it at the back. There should be four pins in each target face.

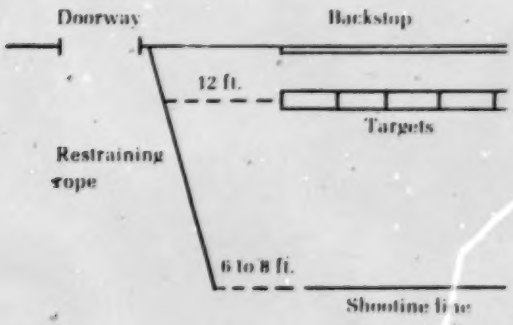
TARGET INSTALLATION: Target matts are placed on stands or are held in place by wires or ropes. This can be done by attaching wire loops to the top of each matt and stringing the loops onto a wire or rope that is attached very securely to standards (such as badminton or volleyball) anchored to the floor, or to hooks anchored in the wall. The top of the target matts should be angled slightly backward. If a matt should fall, it will then fall backward and thus not break arrows that might be in the target.

Shooting Line To designate the shooting line, floor marking tape or masking tape should be placed on the floor 20 feet (and/or other desired distances) from the base of the targets. If tape is impractical or unavailable, a rope or measuring tape may be used.



(Figure I)

SHOOTING LINE (Figure I - above): To designate the shooting line, floor line, floor marking tape or masking tape should be placed on the floor 20 feet (and/or other desired distances) from the base of the targets. If tape is impractical or unavailable, a rope or measure tape may be used.



(Figure J)

BACKSTOP (Figure J - above): A backstop should be hung 2 to 3 feet from the wall and 2 to 10 feet behind the targets to prevent arrows from hitting the wall. Suitable backstops include commercial nylon backstop nets which are very effective in stopping arrows; an old rug or series of

rugs or moving van carpets; parachutes; canvas; or cellotex. If a cellotex board is used, a minimun of 8 feet should be allowed between the targets and the backstop. If a fabric backstop is used, it should be attached at the top only to allow flexibility to absorb the shock of the arrows and prevent penetration.

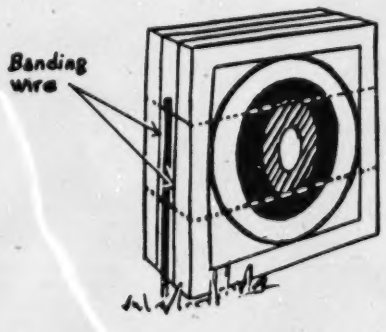
Any indoor backstop should be a minimun of 8 feet from the top to the floor. If there is concern about the possibility of arrows hitting and damaging the floor in front of the targets, such as in a gymnasium, it is helpful to rest the targets on rubber runners, canvas-covered tumbling mats, or a rug extended 6 to 8 feet in front of the targets. Beginning students, however, tend to shoot high, so generally there is little need to worry about damaging the floor.

Point of Safety: Whenever possible, arrange facilities so that there is no possibility of participants inadvertently walking behind the targets while shooting is in progress. In the event a path of traffic must cross the room, secure a restraining rope diagonally from the shooting line to the targets with a distance of 6 to 8 feet beyond the end of the shooting line and a distance of 12 feet beyond the target line.

Outdoor Facilities

SHOOTING AREA: Use any outdoor area on the school site--the football field, practice field, hockey field, playground, or tennis court. Safety must be the prime factor in all instances. Grass or dirt surfaces are preferable, but not necessary.

TARGET INSTALLATION: The range set-up is basically the same as indoors, with a few exceptions. Wire loops should be secured through the sides of the target matts rather than through the tops of the matts, with metal or wooden stakes or posts placed through the loops and anchored securely in the ground.



NON-PERMANENT TARGETS: When targets must be installed and removed for each archery class, the movable kind is recommended. They can be set up in the following manner:

Pipes that are 2 feet long and 1 1/2 inches in diameter should be spaced 38 inches apart and driven into the ground until the top end of each pipe is slightly below the surface of the ground.

Prior to each class, the instructor and/or students can insert a pipe or stake that is 5 feet long and 1 inch in diameter into each of the recessed pipes and secure the target matts to the pipes or stakes by attaching two wire loops on each side of the matt and sliding the loops onto the pipes or stakes. (Figure L - page #17)

If desired, the recessed pipes can have a threaded end so that a cap can be placed over the pipe opening. This will prevent rain and debris from falling into the pipes when the range is not in use.

Commercial movable target stands can also be used. Tripods can be used, although they are more cumbersome to transport and set up. In an outdoor range, the tripods should be anchored. Another idea for target stands is to use track hurdles upside down and wire the matts to the legs.

PERMANENT TARGETS: Permanent targets can be installed in the following manner:

Each target will require two supports. The supports should be approximately 6 feet long and can be of the following materials: 1-inch pipes, 2 1/2-inch cedar posts. 2- by 4-inch wooden stakes, or steel fence posts. Stakes should be driven into the ground 38 inches apart and to a depth of at least 2 feet. An old rubber tire or 2 by 4s should be placed on the ground between the two supports.

The bottom bale of excelsior or straw should be placed on top of the tire or 2 by 4s so that it does not rest on the ground. This preserves the bales and eliminates arrows sliding underneath. Two more bales should be stacked on top of the first, and all three bales should be banded together by using a banding tool or two straps of No. 8 wire. This is done by completely encircling the bales and tightening the wire. If four or five bales are desired, the target supports should be within 6 inches of the top. Supports should never extend higher than the top of the bales.

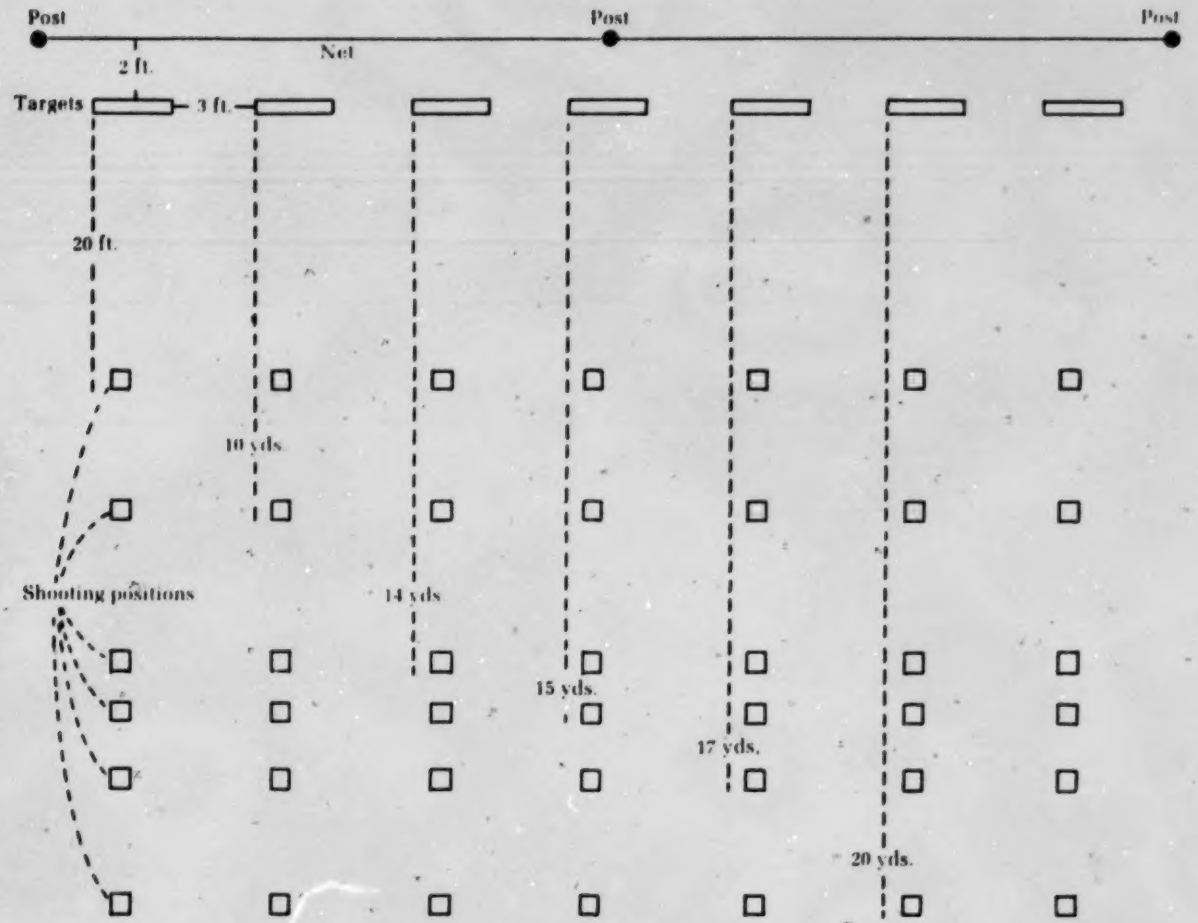
When using metal supports it is best to cover the surface of the supports with heavy rubber, such as old car tires, bicycle tires, or rubber hose cut in half lengthwise. To protect excelsior or straw bales from too much water, the top bale should be capped with a protective covering of plastic or roofing paper.

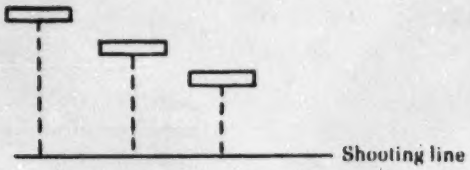
In the layout for indoor shooting, target matts are placed side by side, touching each other. If space permits (especially outdoors) spacing targets 3 feet apart provides more room for shooters and ease of retrieving arrows.

SHOOTING LINE: A shooting line can be indicated by marking compound or with a rope or measuring tape stretched between stakes. The stakes should be placed directly in front of each target. For a permanent range, cement or patio blocks, bricks, or similar blocks can be recessed into the ground

to indicate shooting positions. The distance from the target face to the shooting position could be painted on the face of the block.

The modified Chicago round is shot from the 20-yard distance. In the modified Flint round, six different distances are needed: 20 feet, 10 yards, 14 yards, 15 yards, 17 yards, and 20 yards. When students are shooting at different distances at one time, one common shooting line should be used and the targets should be set at various distances.





BACKSTOP (Figure M - above): *If a backstop is used, it should be of a "see-through" type (e.g., a nylon net) to enable the instructor to have complete visibility behind the target line.* Posts on which the net is hung should be approximately 25 feet apart. The net should be hung from a heavy wire (No. 8 clothesline) placed 9 1/2 feet from the ground. The recommended net height is 10 feet.

When shooting from beginning distances (20 feet to 20 yards), there should be a minimum of 30 yards clear behind the targets if no backstop is used. A hill is a natural backstop, but care should be taken to prevent anyone from wandering from behind the hill while class is in session.

V. PROGRAM

The following outline is a suggested approach to teaching archery. The instructor may wish to add to the program or delete as he sees fit. This is only one way and many other programs can be designed.

1. Basics

   A. Immediate Participation
   B. 20 feet - Immediate Success

2. Basics and Follow Through

   A. 20 feet - talk them through the 10 steps for at least 3 arrows
   B. Remember to use student coach/shooter method

3. Basics and Release

   A. 10 yards — Start Scoring
   B. 15 yards
   C. 20 yards — 9, 7, 5, 3, 1

4. Basics - Aim (Pre-Gap)

5. Basics

   A. Competitive Round

      1. 20 yards
      2. 36 inch target
      3. 5 arrows per end, 4 ends per game, 3 games per round
      4. Score: 5, 4, 3, 2, 1
      5. Total points 300

6. Basics

   A. Archery Games (see archery games)

7. Basics

   A. Shoot at varying distances up to 30 yards. Remember SAFETY

Archery Games

Tic Tac Toe

Place three rows of three balloons on a target matt. Divide the group into two lines, A and B, and have them stand in a single file 15 yards from the target. If the group is under 14 years of age, a distance of 20 feet is sufficient. Each group will have a captain who will be reponsible for indicating to each team member which balloon he should shoot. At the signal to shoot, each captain will shoot one arrow and step back. The second and succeeding person will shoot--one at a time--when ready, then go to the back of the line. The first team to break three balloons in any line is the winning team.

Point of Safety: No one should be allowed to take an arrow from his quiver until he is standing on the shooting line.

Wand Shooting

Place a strip of 1-inch masking tape over the target face from top to bottom. The group is divided into teams as for Tic Tac Toe and the shooting rules are the same. A game is the best two out of three points. A point is scored when an arrow hits the tape anywhere on the target. When an arrow hits or looks as if it has hit, the range captain will blow his whistle and call the arrow. When a team has scored two points, it is declared the winner.

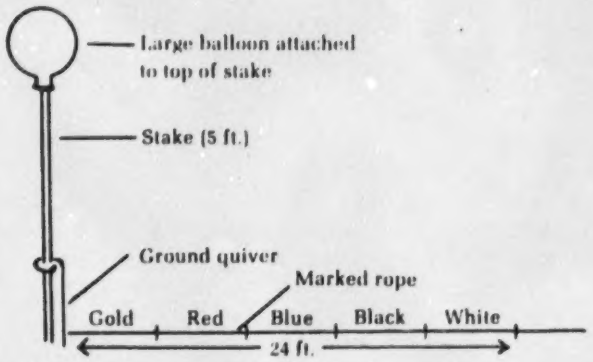
Bird Shooting

Flu flu arrows are needed for this game, along with at least six commercial bird targets or 16-inch circular discs cut from heavy cardboard. Two teams are lined up as for Tic Tac Toe. The bird thrower should be to one side of the shooters and hidden from view if possible. When the two teams are on the line with arrows nocked, the range captain calls "Pull." The bird thrower can throw the bird at any time within 20 seconds after the call and at any elevation or angle. It is suggested that the birds be thrown across and in front of the shooters at a distance of no more than 10 yards. Each member of both teams should have at least three shots. Any hit (determined by the range captain) scores one point. The team with the highest score wins the game.

Clout Shooting

This is not a regulation clout. The distance is 90 yards from the shooting line to the center of the target. Drive a 5-foot wooden stake into the ground for the center of the target. Attach a large (12-inch diameter) brightly colored balloon to the top of the stake as a marker. The clout is then scored and shot like a regular clout except that only four ends are

shot. The competition is between total team scores. Any team that breaks the balloon gets an additional 50 points added to its total score. Rope can be attached to the ground quiver. The stake can then be removed when scoring, thus allowing the rope to rotate more easily for more accurate scoring.



Much of the material is taken from: Archery. A Planning Guide for Group and Individual Instruction, Prepared by the AAHPER Committee under the supervision of Julian W. Smith, Director, AAHPER Outdoor Education Project.

*Call Balloon

The balloons are secured to the face by nails or target pins. The archer identifies the color before he attempts to break it. Scores may be recorded.

*Taken from: Archery. Campbell, Donald W., Prentice-Hall, Inc., Englewood Cliffs, New Jersey.

VI. INSTRUCTIONAL RESOURCES

Books

American Association for Health, Physical Education, and Recreation. Archery. Washington, D. C.: AAHPER, 1972.

American Association for Health, Physical Education, and Recreation. Physical Education for High School Students. 2nd edition, Washington, D. C.: AAHPER, 1970.

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Burke, Edmund. The History of Archery. New York: William Morrow and Company, 1957.

Division for Girls and Women's Sports. Archery-Riding Guide. Washington, D. C.: AAHPER. Published biennially.

Haugen, Arnold O. and Metclaf, Harlan F. Field Archery and Bowhunting. New York: Ronald Press, 1963.

Keaggy, David J., Sr. Power Archery. 2nd edition, Paradise Valley, Arizona: Power Archery Products, 1968.

Klann, Margaret. Target Archery. Reading, Massachusetts: Addison-Wesley Publishing Company, 1970.

McKinney, Wayne C. Archery. 3rd edition, William C. Brown Company, 1975.

National Archery Association. The Archer's Handbook. Ronks, Pennsylvania: Clayton Shenk, 2833 Lincoln Highway East, 1968.

Niemeyer, Roy K. Beginning Archery. Rev. edition, Belmont, California: Wadsworth Publishing Company, 1967.

Pszczola, Lorraine. Archery. Philadelphia: W. B. Saunders Company, 1971.

Periodicals

Archery Magazine. P. O. Box H, Palm Springs, California 92262. Monthly. Official publication of the National Field Archery Association.

Archery World. 534 N. Broadway, Milwaukee, Wisconsin 53202. Monthly. Official publication of the National Archery Association.

Bow and Arrow. Gallant Publishing Company, 116 E. Badillo, Covina, California 91722. Bimonthly.

VII. BIBLIOGRAPHY

Films

Archery. Set of 4 color Super-8 cartridge film-loops. Ealing Films, 2225 Massachusetts Avenue, Cambridge, Massachusetts 02140. The sets cover the Basic skills; Nock, anchor, and release; Aiming (pre-gap method); and Aiming (sight method).

Archery Today. 16 mm., sound, color, 22 minutes. Rental from Grayling Film Service, Route One, Grayling, Michigan 49738 ($10.00). The film deals with hunting safety.

Men's Archery and Women's Archery. Set of 3 Super-8 loop films. The Athletic Institute, 705 Merchandise Mart, Chicago, Illinois 60654. Each set includes Stance-nocking the arrow; Draw, aim, and hold; and Release and follow through.

Outdoor Education. 16 mm., sound, color, 28 1/2 minutes. Purchase or rental from NEA Sound Studios, 1201 16th N. W., Washington, D. C. 20036. A portion of the film is devoted to archery as part of an outdoor education program.